

REMARKS

Claims 1-16 are pending in this application. This Amendment amends claims 1 and 8 and adds new claims 17 and 18. Support for all amendments to the claims can be found in the specification and drawings as originally filed.

35 U.S.C. § 112 Rejections:

Claims 1-16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that the Applicants regard as the invention. While the Applicants believe that the phrase "internal chill casting" is a well-known technical phrase, claims 1 and 8 have been amended to remove this language. The Applicants believe that the above amendments to claims 1 and 8 overcome the Examiner's indefiniteness rejections. Reconsideration of these rejections is respectfully requested.

35 U.S.C. § 103(a) Rejections:

Claims 1-16 stand rejected under 35 U.S.C. § 103(a) for obviousness over JP 2000-254768 A (hereinafter "the '768 reference") in view of French Patent No. 1,243,333 (hereinafter "the '333 patent"). In view of the following remarks, the Applicants respectfully request reconsideration of these rejections.

The present invention is directed to a method for manufacturing an aluminum cast product enclosing a pipe inserted therein. A controlling member is projected into a cavity of a mold. A pipe is arranged at a predetermined position in the cavity. The pipe is held in the cavity by insertion of the controlling member into at least one opening of the pipe or by insertion of at least one end of the pipe into a hole of the controlling member. A molten aluminum alloy is poured into the cavity so as to enclose the pipe with the aluminum alloy.

The present invention is also directed to a method for the production of an aluminum cast product enclosing a pipe therein. A bracket having a hole is coupled to a pipe. The pipe is arranged at a predetermined position in a cavity of a mold. The pipe is held in the cavity by inserting a controlling pin into the hole of the bracket. The controlling pin extends through a wall of the mold into the cavity. A molten aluminum alloy is poured into the cavity so as to enclose the pipe within the aluminum alloy.

The '768 reference discloses a method where the pipe is fixed in a cavity of a mold by clamping both ends of the pipe between upper and lower mold members or fixing the pipe with a core. Since both ends of the pipe are clamped between the metal mold members, under such conditions of pouring a molten aluminum alloy into the cavity, a middle part of the pipe apart from the clamped ends is likely to change its position. A gap between the pipe and an inner surface of the mold may become narrower. Additionally, the pipe may project to the outside from the cast product. If the pipe in the cast product is greatly deviated from a predetermined position, it is then necessary to form a hole for coupling a bleed screw or the like to the pipe.

The method of the present application is distinguished from the method of the '768 reference by the holding of the pipe to be enclosed. That is, the pipe is held in a manner so that it is moveable in its axial direction without radial dislocation at its end (see page 9, lines 10-12). Axial movement of the pipe effectively absorbs thermal stresses applied to the pipe during pouring of the molten alloy and assures location of the pipe at an initially designed position. In contrast, the '768 reference intends to control the cooling conditions of a poured molten alloy. Since both ends of the pipe are clamped between upper and lower mold members, axial movement of the pipe cannot be expected during pouring of the molten alloy. The '768 reference does not teach or suggest holding the pipe by insertion of a controlling member into at least one

opening of the pipe or by insertion of at least one end of the pipe into a hole of the controlling member. The '333 patent does not cure this deficiency.

For the foregoing reasons, the Applicants believe that the subject matter of independent claims 1 and 8 is not rendered obvious by the '768 reference in view of the '333 patent. Reconsideration of the rejections to claims 1 and 8 is respectfully requested.

Claims 2-7 and 9-16 depend from and add further limitations to amended independent claims 1 and 8 and are believed to be patentable for the reasons discussed hereinabove in connection with independent claims 1 and 8. Reconsideration of the rejections of claims 1 and 8 is respectfully requested.

New Claims:

New claims 17 and 18 have been added by this amendment. No new matter was added. Support for new claims 17 and 18 can be found in the specification and drawings as originally filed. Claims 17 and 18 are also believed to be allowable over the prior art of record.

New claim 17 is directed to a method for manufacturing an aluminum cast product enclosing a pipe wherein the controlling member is configured to allow axial movement of the pipe without radial dislocation. New claim 18 is directed to a method for production of an aluminum cast product enclosing a pipe wherein the controlling pin is configured to allow axial movement of the pipe without radial dislocation. These additional claimed features are not addressed in the prior art. Therefore, allowance of new claims 17 and 18 is respectfully requested.

CONCLUSION

In view of the foregoing, the Applicants believe that claims 1-16 and new claims 17 and 18 are in condition for allowance. Reconsideration of the Examiner's rejections and allowance of claims 1-18 are respectfully requested.

Respectfully submitted,

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1. (Once Amended) [An internal chill casting] A method for manufacturing an aluminum cast product enclosing a pipe inserted therein, which comprises the steps of:

projecting a controlling member into a cavity of a mold;

arranging a pipe at a predetermined position in said cavity of said mold;

holding said pipe in said cavity by insertion of said controlling member into at least one opening of said pipe or insertion of at least one end of said pipe into a hole of said controlling member; and

pouring a molten aluminum alloy into said cavity so as to enclose said pipe with said aluminum alloy.

8 (Once Amended) [An internal chill casting] A method for production of aluminum cast product enclosing a pipe therein, which comprises the steps of:

coupling a bracket having a hole to a pipe;

arranging said pipe at a predetermined position in a cavity of a mold;

holding said pipe in said cavity by inserting a controlling pin, which extends through a wall of the mold to the said cavity, into said hole of said bracket; and

pouring a molten aluminum alloy into said cavity so as to enclose said pipe with said aluminum alloy.

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